Name _____

Diffusion and Osmosis

Purpose: To determine how different substances move in and out of a cell
To determine how the size of a molecule affects diffusion

Hypothesis: I predict _____ will diffuse easily across the cell membrane but _____ will not.

Procedure:

Set Up A

1. Fill ¾ of a cup with water
2. Soak a piece of tubing in the cup for about 30 seconds
3. Tie a double-knot in the bottom of the tubing
4. Pour starch solution into the tube and double-knot the top, leaving some air between the liquid and the knot
5. Rinse the tube under running water and place in cup
6. Add enough iodine to cup to turn water yellow
7. Observe tube and cup

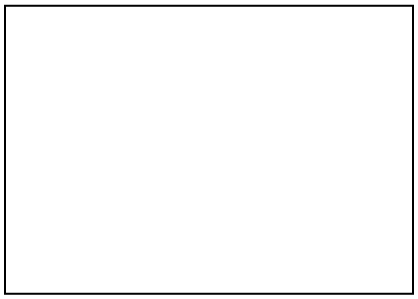
Set Up B

1. Repeat steps 1-3 of set up A
2. Pour sucrose solution into the tube and double-knot the top, leaving some air between the liquid and the knot
3. Rinse the tube under running water and pat dry with paper towel
4. Find and record mass of tube
5. Place tube in cup of water
6. Let sit overnight and record mass of tube

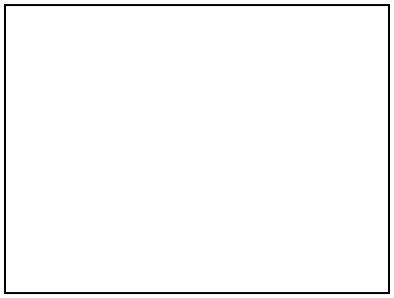
Data:

A--Draw the cup and tube before and after. Indicate the color of each.

Before



After



B-- Mass before _____ Mass after _____

Analysis:

1. On the basis of the chemical test for starch, what must have happened to the iodine molecules in Beaker A? How do you know this?

_____

_____

2. Did the starch molecules pass through the membrane? How do you know?

_____

_____

3. In Set up B, what happened to the mass of the tube after sitting overnight?

_____

4. Why did the mass in Set up B change?

_____

_____

Physicists can show that the molecules of any one substance are all about the same size, but that the molecules of different substances are different in size. Measurements show that iodine molecules and water molecules are very small, glucose molecules are considerably larger, sucrose molecules are larger still, and starch molecules are very large.

5. Based on the above information and your lab results, what can you determine about one of the "criteria" used by the cell membrane (based on its structure) to determine what can and cannot pass through it? Which substances from this lab do pass through the membrane? Which substances from this lab do not pass through the membrane?

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